B.C. HYDRO

# NICOLA-SELKIRK-CRANBROOK 500 kV TRANSMISSION LINE

## POST DEVELOPMENT EVALUATION OF IMPACTS AND PUBLIC CONSULTATION PROGRAM

SYSTEM ENGINEERING DIVISION
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NICOLA-SELKIRK-CRANBROOK 500 kV TRANSMISSION LINE

POST DEVELOPMENT EVALUATION OF
IMPACTS AND PUBLIC CONSULTATION PROGRAM

CONTENTS


| Section | Subject | Page |
|---|---|---|
| 1.0 | INTRODUCTION | 1 |
| 2.0 | STUDY RATIONALE | 2 |
| 3.0 | STUDY METHOD | 3 |
| 4.0 | STUDY RESULTS | |
| | (a) General | 4 |
| | (b) Visual | 5 |
| | (c) Wildlife | 8 |
| | (d) Forestry | 9 |
| | (e) Fishery | 9 |
| 5.0 | CONCLUSIONS AND RECOMMENDATIONS | 11 |
| | REFERENCES | |
| | TABLE 1 | |


APPENDICES


| Appendix No. | |
|---|---|
| I | List of Agencies, Groups, etc. who were sent the questionnaire |
| II | Photographs of Line |

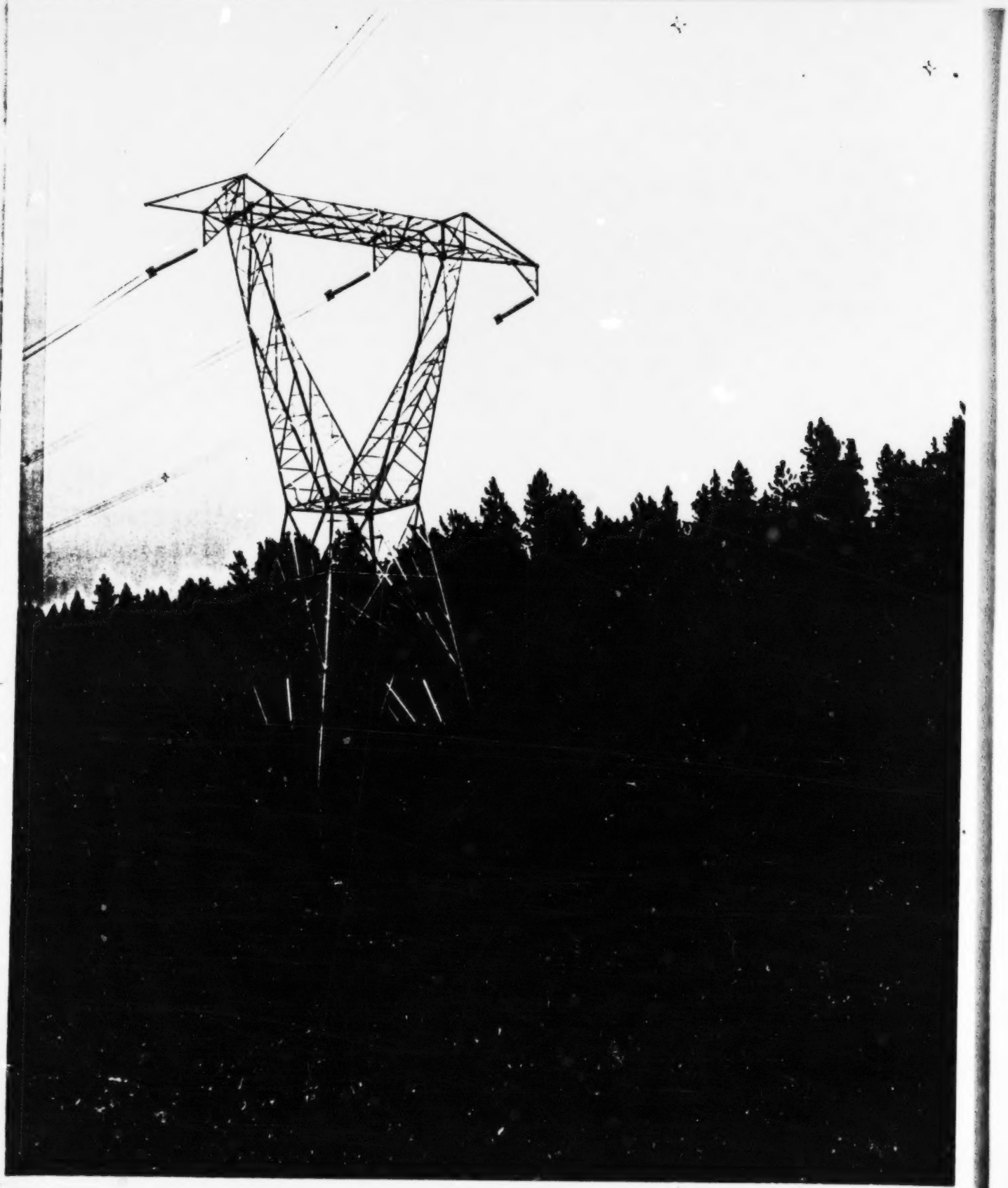


Photo 1
A structure immediately west of the Dale Marsh in the Creston valley.

ER135/1

## 1.0 INTRODUCTION

Over the past 20 years, B.C. Hydro has planned, designed and constructed approximately 5000 circuit kilometres of 500 kV transmission lines. During the 1960s, transmission line route selection primarily focused on engineering specifications and construction costs. In the 1970s, environmental and socio-economic awareness on the part of the public, government and resource management agencies gradually became evident, with resulting influence on new transmission line locations and construction practices. Today, environmental and socio-economic considerations have a bearing on planning, locating and constructing all new transmission lines.

This post development evaluation of the Nicola-Cranbrook 500 kV Transmission Line addresses the question of the extent to which environmental and social considerations were successfully incorporated into a major transmission project with emphasis on visual impact and public input.

The Nicola-Selkirk-Cranbrook 500 kV project was selected for evaluation because it was the first major transmission line in British Columbia to incorporate significant public consultation during the planning stage.

Planning of the 480 km line began in 1974. The planning process included an assessment of route location alternatives and potential construction impacts on the environment. Once the technical parameters of the line were determined, an environmental consultant (Ian Hayward and Associates) was retained to assess and evaluate the environmental and socio-economic implications of locating and constructing such a line, and to provide environmental guidelines for those mitigating impacts which could not be avoided.

Public input was sought through a consultation process. Discussions were held with provincial resource agencies, local and regional governments, community organizations and special interest groups. The pre-eminent concern expressed during this "public consultation phase" was the potential visual impact of the line, and this concern led to specific mitigation measures.

Other concerns related to impacts on fishery, wildlife, forestry, agriculture, recreation, heritage and water quality. The fear expressed was that right-of-way clearing and line construction would adversely impact on these resources.

Line construction was completed and the circuit energized in 1981.

## 2.0 STUDY RATIONALE

In response to the wide public concern about the potential adverse visual impact of the line, considerable effort was expended to minimize it. This follow-up evaluation assesses the as-built condition of the line and reports on the following matters:

1. What level of success was achieved by the various means used to mitigate potential impacts of the line?

2. How acceptable was the line as developed, from the perspective of the people who were the most seriously affected by it?

3. What lessons were learned for application to future transmission line projects regarding the incorporation of environmental and socio-economic considerations into transmission projects?

## 3.0 STUDY METHOD

Two data collection methods were used for this study - a questionnaire and a visual/photographic survey.

The questionnaire was sent in June 1984 to local and regional governments, government resource agencies, local environmental organizations and special interest groups (see Appendix I).

The questionnaire invited responses to the following seven questions:

1. Now that the transmission line is in service, does it affect you, or the region in which you live, in a significant way? If so, how?

2. Do you have any comments on the visibility of the transmission line? If so, please specify locations where your comments apply.

3. Do you have comments about the planning and location of the transmission line (availability of information, opportunities for discussion with Hydro, Hydro's responsiveness, etc.)?

4. Do you have comments about how the project was constructed?

5. Do you have specific suggestions or comments on how Hydro might enhance its planning or construction procedures?

6. Do you have any comments about the ongoing maintenance of the project (e.g., right-of-way management) now that it is in service?

7. Any other comments?

Most questionnaire responses required no direct follow-up, but there were four which required further clarification from respondents.

The visual survey of the line was conducted by B.C. Hydro staff. It involved photographing areas that were identified as visually sensitive during the planning of the line, and where the impact of the line had been anticipated to be intrusive on the surrounding landscape. The study included an analysis of the predicted visual impacts at certain locations, the mitigative measures employed to screen the line, and the present visibility of the line from the normal vantage points used by the public.

## 4.0 STUDY RESULTS

### (a) General

Responses to the questionnaire provided useful information on the impact of the line and its general acceptability. Twenty-five out of thirty-five of the groups and agencies contacted provided responses.

Visual effects, wildlife, forestry, fisheries and heritage generated the only specific comments. Other topics such as agriculture, recreation, and water quality were also well discussed during the route planning of the line, however, these were not addressed in any of the questionnaire responses.

Table I is a tabulation of the more predominant environmental concerns expressed during route planning of the transmission line and lists the measures taken to alleviate potential environmental impacts. Also included are comments on the overall successes of mitigative efforts as determined from the questionnaire responses.

Detailed comments on the respective environmental disciplines follow.

(b) Visual

(i) Questionnaire Responses

During the planning stage of the project, visual concerns were the most contentious issues raised. In particular, where the line was routed in the proximity of highways, or crossed highways (see Table I), the fears expressed by local individuals and groups indicated that the line would be most obtrusive and would impair the visual landscape.

When this question was asked directly, most respondents to the questionnaire admitted that the line was not as visually obtrusive as was anticipated. One respondent even commented that it was "one of the better located transmission lines in the province for visual protection from main tourist travel corridor". (The line was shielded as much as possible from view of the travelling public by the use of topography selective clearing techniques and judicious placement of towers). Special mention was made of the McIntyre Bluff area in the Okanagan Valley which was the focus of much public debate during the route planning of the line. The response indicated that the impact of the line was substantially less than originally feared.

Two respondents commented that the efforts expended to make the right-of-way relatively inconspicuous in the vicinity of some roads and at some road crossings were successful. (This was accomplished by either foregoing clearing or the application of selective clearing as appropriate, or by only topping trees where practicable.) In locations where the transmission line towers did in fact stand out against the background, one respondent suggested that the towers should have been toned to

match the background. Another respondent criticized B.C. Hydro for not using more aesthetically pleasing towers (or steel poles) in highly visible locations.

The use of aircraft warning aerial markers was described by one respondent as the most unfortunate visual feature of the line. Adherence to Transport Canada's requirement to install conspicuous aircraft warning marker balls on the conductors at several highway crossings has to some extent impaired attempts to minimize visual impact.

There was also one remark to the effect that the line did not enhance the landscape and that some unsightly areas existed where the line converged on other lines.

Finally, one respondent, recognizing the difficulty of assimilating all the public input and arriving at a suitable solution, remarked that "B.C. Hydro did very well in final placement, considering the many conflicting opinions".

(ii) Visual Assessment Study

From the B.C. Hydro's visual assessment study, it was determined that only 66 km out of a total line length of 480 km, or approximately 14 percent, is located in view of settled areas or main highways. This was due to the careful selection of right-of-way alignment and tower location. The use of guyed-V lattice structures at most locations has been a factor in reducing the visibility of the line since these structures are virtually invisible when viewed from a distance.

The section of line that was most opposed on the basis of visibility was the Okanagan Valley crossing at McIntyre Bluff.

While recognizing that the aesthetics of a transmission line is very subjective, analysis of the completed line indicates that it does not have a significant negative impact on the visual quality of the area. The Regional District of Okanagan-Similkameen supported the Environmental Consultant's recommendation for this crossing, in that steel poles be used, and painted in a colour that would blend into the landscape. B.C. Hydro complied with these recommendations. Helicopters were used in the foundation installation and tower erection for one of the structure sites. Special consideration was also given to route alignment, structure locations and selective clearing, so that the line in this area would be concealed as much as possible from the public view.

The final route was not the shortest or the most economical, but was the best compromise solution incorporating the concerns of a number of interested groups and individuals. Photos appended to this report (see Appendix II - Photo Nos. 9, 10, 11, 12, 13, 14, 16 and 18), were taken from well travelled or well used locations. These photos show the level of success attained in reducing the visibility of the line.

Deliberate attempts were also made to conceal the line from the road to the Apex Alpine Ski area. Several structures are screened from view from the road and the line is not visible from the ski area itself.

The Highway 3A crossing between Penticton and Keremeos (vicinity of Yellow Lake) is quite visible. However, use of the guyed-V lattice and the nature of the vegetation allow the line to be unobtrusive. See Photos 7 and 8.

Aesthetics was also of concern in the Christina Lake/Cascade area. Photo 30 shows the Highway No. 3 crossing where the

right-of-way is successfully concealed by a screen of trees, with some tree topping done where necessary.

The routing selected across the Creston Valley also generated opposition because of the anticipated visibility of the line from the surrounding settled areas. Photo 38 illustrates the typical visibility of the line across the Creston Valley. Here, rigid self supporting structures, instead of the less noticeable guyed-V structures, were used across the valley to reduce the impact on agricultural activities. However, owing to distance and tree screening the line is not visible from the town of Creston.

(c) Wildlife

From the questionnaire responses, impacts on wildlife populations and wildlife habitat now generate concerns among some wildlife interest and local hunting groups. The construction of several new access roads was cited as the cause of increased wildlife vulnerability to hunting in the Monk Creek and Boundary Creek valleys. In addition, the groups contended that the clearing of rights-of-way in some locations either removed wildlife habitat or restricted migration or daily travel routes of wildlife.

At the request of one respondent organization in the Trail area, a meeting was held to discuss various concerns about the apparent proliferation of recently created access roads into wildlife areas because of the new transmission line. This matter is being pursued by B.C. Hydro to determine whether some roads can be closed off or allowed to deteriorate.

Some conflicting comments also emerged primarily in the area of right-of-way treatment and control. A few respondents favoured a clean cut, grubbed, and grass-seeded right-of-way to facilitate

forage production for wildlife and livestock. They noted that the rights-of-way also create desirable habitat for certain wildlife species. Others contended that a clear cut swath of right-of-way was detrimental to wildlife by cutting off migration or daily travel routes, as well as providing hunters with easier vehicular and other access to wildlife habitat.

(d) Forestry

The major forestry concern expressed through the questionnaire related to the development of rights-of-way and access roads since these permanently take land out of timber production and therefore reduce the forest resource base. Of secondary concern were problems of increased brush control costs where rights-of-way were located in highly productive forest areas, and isolation of strips or blocks of timber.

On the other hand, it was mentioned that rights-of-way and access roads through forested areas provide access for forest recreation and create breaks for forest fire control.

(e) Fishery

Questionnaire responses identified access road construction and unseeded grubbed rights-of-way as the source of some soil erosion and stream sedimentation, with the resultant negative impact on fish spawning. Follow-up discussions revealed that such a problem occurred in Boundary Creek and a tributary thereof, as well as in the Salmo River. Inadequate drainage control where access roads and skid trails crossed these waterbodies were cited as the reason for the problem, a situation that present construction standards and procedures now would control.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

During planning of the project line, B.C. Hydro's public consultation phase of the program focused on items of concern to government agencies, special interest groups and interested individuals. These concerns were extensively evaluated and preventive or mitigative measures implemented as necessary. In some instances compromise solutions had to be adopted. Many of the concerns extensively debated during the route planning are of no concern today. This can be partly attributed to the mitigative measures employed during the locating, design and construction of the line, but to no small degree resulted from the actual impacts of the completed project being substantially less than anticipated.

From the comments received through the questionnaire responses (see Table I), it can be concluded that the final decisions on route location and design resulted in a completed line that has not attracted much open criticism. As well, impacts on resources such as heritage, agriculture, recreation and water quality either did not materialize as feared, or were too insignificant to mention.

Reflecting on the visual aspects of the line, there were demands during the route planning stage for the use of aesthetic steel poles in the Okanagan valley at McIntyre Bluff, as well as in the Creston valley. After much debate, including an evaluation of the respective costs, the determination was made that steel poles could only be justified at McIntyre Bluff. Now that the line is in service, some would comment that the aesthetic steel poles at McIntyre Bluff appear to be more conspicuous than the standard guyed-vee towers. However, no adverse remarks were received from residents in the area. A comment received from the Creston valley on the other hand stated that they would have preferred to see aesthetic steel poles in the valley. The aesthetic value of steel poles versus standard lattice towers still remains a subjective issue, and no definitive rules can therefore be applied. However, it would appear that the lattice type tower is effectively less

obtrusive when viewed at a distance and/or when located against topography whereas the painted single pole aesthetic tower is appreciated more when located very close to high use areas. Aesthetic concerns in the Rock Creek-Grand Forks area were debated at length during public discussions on the project. However, the questionnaire responses now indicate no significant concerns in that area.

The lessons learned from that experience have influenced subsequent routing decisions and construction practices. The environmental concerns then expressed contributed to the adoption of formalized environmental protection measures, some of which are now standard practices.

The public consultation program was much appreciated as evidenced by the commendations extended to B.C. Hydro for its responsiveness and efforts in accommodating suggestions and concerns regarding route location. However, there was the indication in some quarters that more prior public consultation would have been desirable. This situation has since been corrected as today's consultation programs are quite extensive and commence very early in the planning stage of new projects.

The problems of new access roads surfaced during the route planning of the line, but not to the same extent as in this post construction evaluation. Current practice regarding access roads and access road construction ensures that they are preplanned as much as possible, in consultation with resource agencies and landowners, that they serve all stages of the project and that the disturbed areas are reclaimed upon project completion.

The right-of-way management program appears to be mostly acceptable, though there were conflicting opinions as to whether there should be clearing to ground level, grubbing and seeding, or whether low growing vegetation should remain intact. This issue might best be resolved on a site specific basis.

The conclusion that can therefore be drawn from the study is that the line was well located and constructed. The visual impact of the line is acceptable to most observers, therefore the mitigative efforts employed were effective.

After an assessment of this post construction evaluation, some important recommendations for improving the management of transmission line projects should be noted:

1. Environmental inspection should be carried out on all transmission line projects during all phases of construction to ensure that all construction crews observe protective measures.

2. Continued emphasis must be placed on the development of access, in consultation with affected groups and agencies.

3. Utilizing multiple use corridors and multiple circuits instead of creating new corridors would please many resource management agencies and conservation groups.

## REFERENCES


1. 500,000 Volt Transmission Line. Nicola-South Okanagan-West Kootenay-Cranbrook. A Location Study, Ian Hayward and Associates Ltd., July 1974.

2. 500,000 Volt Transmission Line. Nicola-South Okanagan-West Kootenay-Cranbrook, Section G, The Preferred Five Mile Corrdior, by Ian Hayward and Associates Ltd. et al, November 1975.

3. An Assessment of Additional Feasible Sites for the Proposed Selkirk Substation, Ian Hayward and Associates Ltd., October 1976.

4. 500,000 Volt Transmission Line. Nicola-Selkirk-Cranbrook. Route Selection Study. Phase II, Text Volume, by Ian Hayward and Associates Ltd., July 1976.

5. 500,000 Volt Transmission Line. Nicola-Selkirk-Cranbrook. Route Selection Study. Phase II, Map Volume, by Ian Hayward and Associates Ltd., July, 1976.

TABLE 1

| Resource | Location | Consultant Concerns | Public Concerns | Route Location or Other Adjustments Made | Cost Consequences (if available) | Results | Questionnaire Response |
|---|---|---|---|---|---|---|---|
| Visual | Creston Valley | Aesthetics | Aesthetics | Line screened with trees as much as possible | - | Line not very noticeable from residential areas (Photos 37, 38, 40) | Only one comment indicating that aesthetic towers should have been used |
| | Okanagan Valley/ McIntyre Bluff | Tower appearance | Impact of line on scenic area | Line screened by topography and natural vegetation; 4 aesthetic poles used; retention of low growing ground cover; some helicopter construction to avoid building new access roads | Costs increased considerably for this segment | Line not very obtrusive from highway or from other popular viewing points (Photos 9, 10, 11, 12, 13, 14, 16, 18) | Final appearance of the line is generally acceptable to most respondents |
| | Highway crossings at: Greenwood (#3), Yellow Lake (#3A), Salmo (#3), Christina Lake/Cascade (#3) | Visibility of line from highways | Visibility of line from highways, towns and recreational areas | Line screened with trees as much as possible; low growing vegetation left intact | - | Line not very obtrusive at highway crossings (Photos 6, 7, 8, 21, 22, 30) | Reaction mixed but mostly positive about the appearance of line from view of general traffic |
| | Rock Creek-Grand Forks | | Impact on residential area | Selected longer route than was necessary to minimize view from residences | - | Line partially hidden from residences | No comment received |
| | Apex Mountain | Preservation of visual quality of area | Visibility from the road to the ski area | Most structures screened from view of travelled area | - | Line not very noticeable from ski resort (Photos 2, 3, 4) | No comment received |

TABLE 1 - (Cont'd)

| Resource | Location | Consultant Concerns | Public Concerns | Route Location or Other Adjustments Made | Cost Consequences (if available) | Results | Questionnaire Response |
|---|---|---|---|---|---|---|---|
| Wildlife | Creston Flats | Disruption to widlife habitat | Impact on waterfowl and other birds; bird strikes | Concerns were discussed with CVWMA. Bird collisions were not a problem as tall trees along the line provided natural screening | - | Minimum disruption to wildlife | No comment received |
| | Monk Creek and Boundary Creek Valleys | Disruption to wildlife habitat | Impact on cariboo due to increased hunter access | Avoided/spanned habitat areas; selective clearing or hand clearing; some helicopter construction to reduce new access | Hand clearing costs - approx. 3 times machine clearing costs | (as above) | Several comments on increased hunting pressures on wildlife due to new access roads |
| | Vaseux Creek area | Disruption to wildlife habitat | Impact on bighorn sheep and deer | Avoided/spanned habitat areas; selective and hand clearing in habitat areas. Access road was not built. Helicopter construction was used. | (as above) | (as above) | (as above) |
| Forestry | Camp McKinney-Grand Forks | | Impact on good forest lands | Placement of line in highly productive forest lands kept to minimum | - | Reduction in forestry losses | Increased brush control costs where right-of-way located in highly productive forest lands |
| | Negro Lake-Cranbrook | Blowdowns due to isolation of strips of timber | Removal of forest land base | (as above) | - | (as above) | (as above) |

TABLE 1 - (Cont'd)

| Resource | Location | Consultant Concerns | Public Concerns | Route Location or Other Adjustments Made | Cost Consequences (if available) | Results | Questionnaire Response |
|---|---|---|---|---|---|---|---|
| Fishery | Little Moyie River | Impact on spawning areas | Stream siltation due to soil erosion during construction; increased access to fishing areas | Restricted clearing close to riverbanks; minimized development of access roads close to river | - | Minimum impact on the resource | No comment received |
| | Kitchener Creek | (as above) | (as above) | (as above) | - | (as above) | (as above) |
| | Boundary Creek | Impact on recreational fishing | Soil erosion/ stream sedimentation | (as above) | - | (as above) | Access road construction and grubbed unseeded rights-of-way caused stream sedimentation. This has now cleared up |
| | Salmo River | (as above) | (as above) | (as above) | - | (as above) | (as above) |
| Heritage | Shepherd Flats | | Impact on historic Fort Shepherd | Line spanned site area | - | No impact on site | Line did not affect any area of importance |
| | Okanagan Valley | Impact on archaeological site | Destruction of important archaeological site | Line spanned site; area around site bought by B.C. Hydro and turned over to Regional District for a park | Additional $4000 to purchase site property | Site preserved | (as above) |
| | Dewdney Trail | | Impact on historic trail | Line spanned sensitive areas | - | Historic area preserved as much as possible (Photo 31) | No comment received |

TABLE 1 - (Cont'd)

| Resource | Location | Consultant Concerns | Public Concerns | Route Location or Other Adjustments Made | Cost Consequences (if available) | Results | Questionnaire Response |
|---|---|---|---|---|---|---|---|
| Agriculture | Creston Flats | | Impact on existing agricultural operations | Line located very close to U.S. border to minimize impact on agricultural lands; rigid self-supporting towers used | Self-supporting structures cost considerably more than guyed ones | Minimized area requirements for structures (Photo 38) | No comment received |
| | Kootenay Flats | | Impact on agriculture; restriction on crop dusting | Rigid self-supporting structures used where appropriate | (as above) | (as above) | (as above) |
| Recreation | Grand Forks (Phoenix Mtn.) | | Interference with ski resort expansion | Route modified to avoid area of proposed expansion | - | Impact avoided | (as above) |
| Water Quality | Joseph Creek watershed | Damage to water supply | Pollution of reservoir by construction activities, use of herbicides, etc. | Line spanned reservoir area; use of max. height towers well back from reservoir; only very tall trees removed from right-of-way | - | Minimum impact on reservoir | No comment received |
| | Moyie Valley | | Damage to potential water supply area | Line routed closely parallel to existing 230 kV line (Nelway-Cranbrook); access road construction kept to a minimum | - | | (as above) |

# APPENDIX I

## LIST OF AGENCIES, GROUPS, ETC. WHO WERE SENT THE QUESTIONNAIRE

Regional District of Okanagan-Similkameen
1101 Main Street West
Penticton, B.C.
V2A 5E6

Kootenay Boundary Regional District
1050 Eldorado
Trail, B.C.

Regional District of East Kootenay
28 - 11th Avenue South
Cranbrook, B.C.
V1C 2P1

Central Kootenay Regional District
601 Vernon Street
Nelson, B.C.
V1L 4E9

Secretary
Castlegar and District Wildlife Association
P.O. Box 3206
Castlegar, B.C.
V1N 3H5

Lister Deer Lodge Club
Lister, B.C.
V0B 1Y0

Town of Creston
906 Vancouver Street
Creston, B.C.
V0B 1G0

City of Trail
1394 Pine Avenue
Trail, B.C.
V1R 4E6

Creston Chamber of Commerce
P.O. Box 268
Creston, B.C.

Salmo District Chamber of Commerce
Box 400
Salmo, B.C.

Creston Valley Wildlife Management Authority
Box 640
Creston, B.C.
V0B 1G0

Creston Survival Group
Box 253
Creston, B.C.
V0B 1G0

Creston Dyking District
Kootenay Associated Drainage District Authority
Creston, B.C.

West Kootenay Outdoorsmen
Box 557
Fruitvale, B.C.

Trail Wildlife Association
Box 266
Trail, B.C.

Grand Forks and District Board of Trade
Grand Forks, B.C.

Christina Lake Community Club
Box 81
Christina Lake, B.C.

Christina Lake Waterworks District
Box 519
Grand Forks, B.C.

Grand Forks Wildlife Association
Box 774
Grand Forks, B.C.
V0H 1H0

Grand Forks Rural Ratepayers Association
RR No. 1
Grand Forks, B.C.

West Kootenay Historical Association
c/o Mr. J. Forbes
544 Portia Crescent
Trail, B.C.

The Corporation of the City of Cranbrook
40 - 10 Avenue South
Cranbrook, B.C.
V1C 2M8

Dominion Radio Astrophysical Observatory
P.O. Box 248
Penticton, B.C.

McKinney Road Landowners' Group
c/o Henry Y. Mann
McCuddy Creek Ranch
RR No. 2
Oliver, B.C.
V0H 1T0

Southern Okanagan Sportsmen's Association
Oliver, B.C.

Okanagan Historical Society
Oliver-Osoyoos Branch
Box 83
Osoyoos, B.C.

Oliver and District Chamber of Commerce
Box 460
Oliver, B.C.
V0H 1T0

Osoyoos Indian Band
P.O. Box 340
Oliver, B.C.
V0H 1T0

Okanagan Similkameen Parks Society
P.O. Box 787
Summerland, B.C.

Northwood Properties Ltd.
304 Martin Street
Penticton, B.C.
V2A 6J6
Attention: Fred T. Stinson
Operating Manager
Woods Division

Nicola Valley Ranchers' Committee
c/o Russ O. Turnbull
Secretary-Treasurer
Quilchena, B.C.
V0E 2R0

Regional Office
Ministry of Lands, Parks and Housing
1050 West Columbia Street
Kamloops, B.C.
V2C 1L4

Ministry of Forests
Regional Office
518 Lake Street
Nelson, B.C.
V1L 4C6

Ministry of the Environment
Regional Office
310 Ward Street
Nelson, B.C.
V1L 5S4

Ministry of Highways
Regional Office
310 Ward Street
Nelson, B.C.
V1L 5S4

# APPENDIX II

## PHOTOGRAPHS OF THE LINE

Photo 2

The view of the transmission line south of the Apex Mountain road. A lengthy section of the line is visible from a distance. The approach to the crossing is hidden behind a small hill.

Photo 3

The Apex Mountain road crossing viewed from the east when travelling from Penticton towards Apex. No structures can be seen on either side of crossing. Only the conductor is visible.

Photo 4

The Apex Mountain road crossing viewed from the west when travelling from Apex towards Penticton. The north side structures are hidden from view and only two structures are visible on the south.

Photo 5

Highway 3A crossing viewed from approximately 1 km south of the crossing, when travelling towards Penticton from Keremeos. The line descending the slope to the crossing is quite obvious from the highway.

Photo 6

Immediately south of the Highway No. 3A crossing, the line is less noticeable, as it is somewhat screened, and a shorter section of the line is in view.

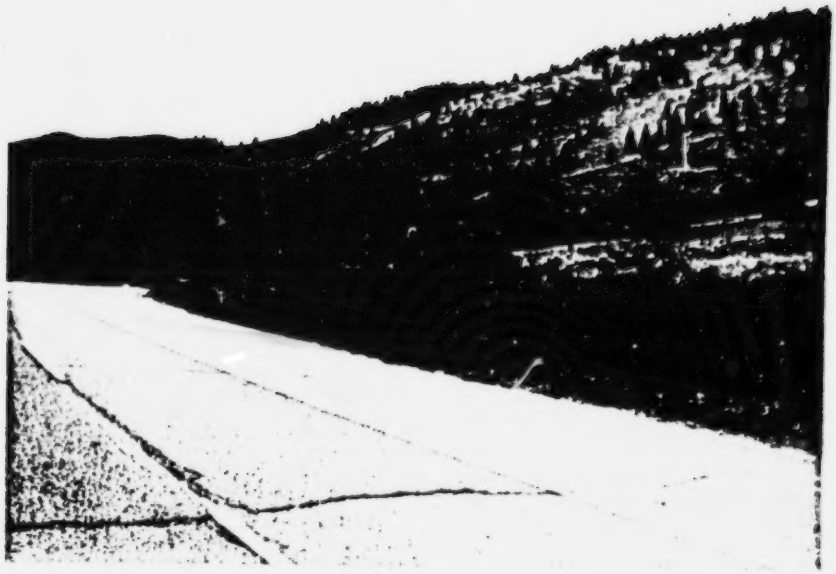


Photo 7

Travelling from north to south on Highway No. 3A, (Penticton to Keremeos), the highway alignment does not provide a view of the transmission line's northerly descent to the crossing. Only two guyed structures are readily visible and the right-of-way is not obvious.

Photo 8

Continuing closer to the actual crossing of Highway No. 3A, the ascent south is noticeable for only a short time. The scattered vegetation of the area does not make the right-of-way obvious and the guyed lattice structures blend into the landscape.

Photo 9

McIntyre Bluff viewed from the north on Highway 3 along Vaseux Lake. The transmission line is not visible.

Photo 10

McIntyre Bluff viewed from the Provincial Park on Vaseux Lake. The transmission line is not visible.

Photo 11

This view of Vaseux Lake and Mcintyre Bluff was featured in the Spring 1976 edition of Beautiful B.C. magazine. Reference was made to this in opposition to the transmission line crossing in the area. Not only does the transmission line not detract from the scenic quality, but it is only barely visible.

Photo 12

Travelling south on Highway 3, a number of structures of the eastern ascent from the Okanagan valley is visible from a distance. The right-of-way clearing blends into the natural sparse vegetation, and the structures or conductor are not overly noticeable.

Photo 13

The transmission line on the west side of the Okanagan Valley is totally screened viewed from the highway to the north.

Photo 14

Immediately north of the crossing, at the base of McIntyre Bluff, only the conductors and aircraft warning marker balls are visible. The structure on the west side of the crossing is hidden from view.

Photo 15

The Okanagan Valley and McIntyre Bluff as viewed from approximately 3 km south of the crossing. The steel pole structure is only barely visible and the right-of-way is not noticeable at all.

Photo 16

The crossing viewed from approximately 1 km south on Highway 3. The aesthetics of the area do not appear to be affected by the transmission line.

Photo 17

The crossing of Highway 3 viewed from bridge.

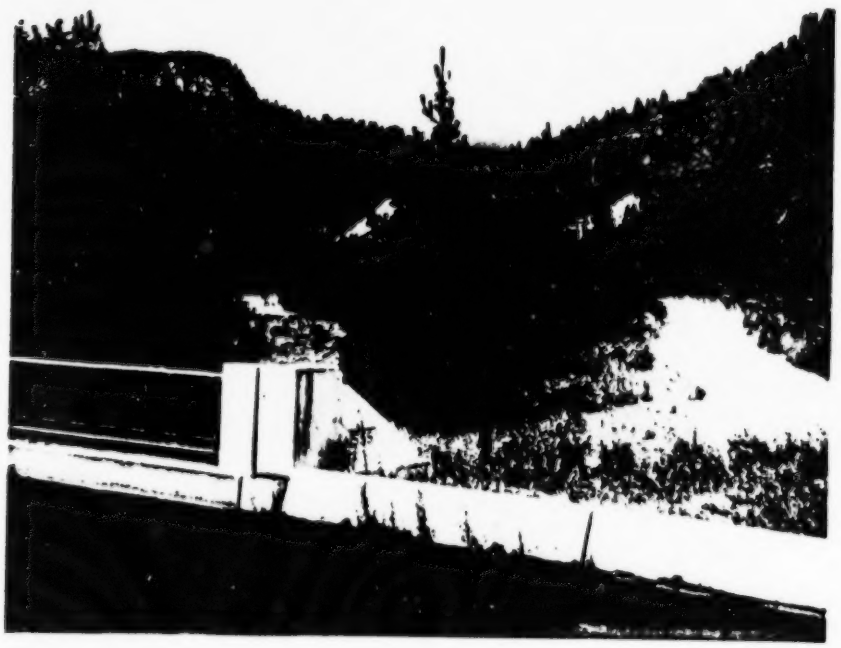


Photo 18

The east side of the valley crossing viewed from the highway bridge. The steel pole structures are more obvious than the lattice structures in the distance.

Photo 19

The Kettle River valley crossing viewed from Highway 33 looking north to the crossing. Two structures on the east side of the valley and the marker balls on the conductor are all that is visible. The west side structures are not in view.

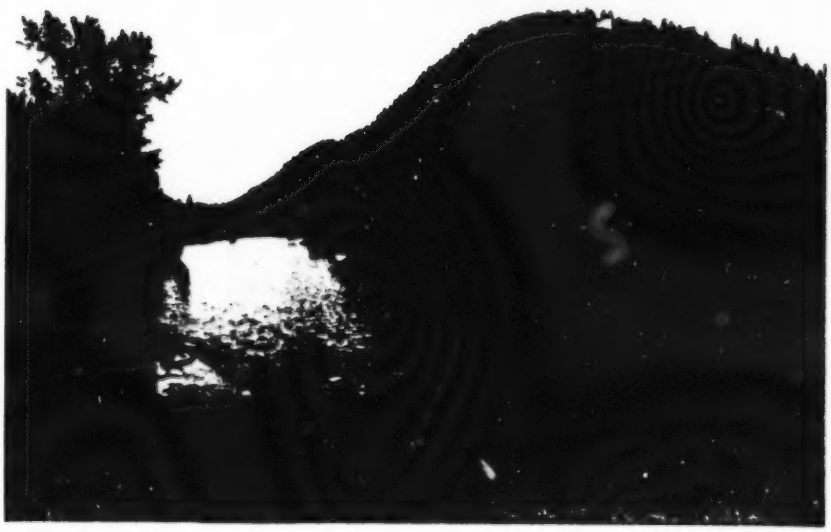


Photo 20

A view of the Kettle River at the valley crossing. No right-of-way clearing is apparent.

Photo 21

The easterly ascent from the Highway 3 crossing viewed from the northern limits of Greenwood. Only the tops of structures and conductors are visible and the visual impact is small due to the distance of the viewer from the line.

Photo 22

The westerly side of the Highway 3 crossing at Greenwood. A screen of trees was retained to conceal the right-of-way from the highway. The crossing is only momentarily visible to the highway traveller.

Photo 23

The crossing of Highway 3 north of Grand Forks viewed from the north. The crossing is almost totally screened from the highway. Only the tops of structures are visible as trees retained on the edge of the highway conceal the right-of-way.

Photo 24

The crossing is also only barely visible from the south. Most motorists likely would be unaware of it.

Photo 25

The Granby River valley crossing viewed from approximately 4 km south. The line and right-of-way although visible, blend into the natural landscape and are not obvious.

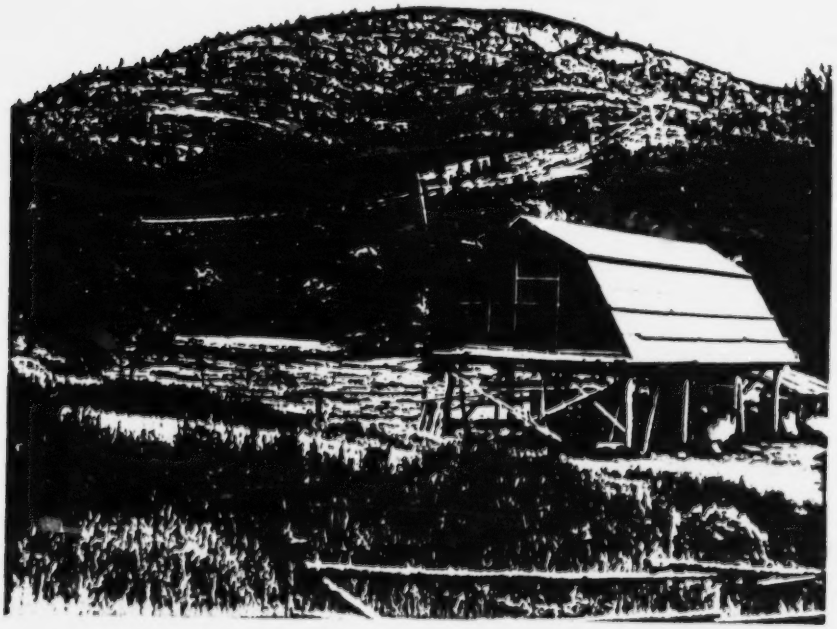


Photo 26

At the Granby River, the right-of-way clearing is not apparent.

Photo 27

The Granby River viewed from the north. The west side of the crossing is not visible. There is not a cleared "strip" on the east side that would emphasize the presence of the transmission line.

Photo 28

The westerly descent to the Highway 3 crossing at Cascade near Christina Lake. The lattice structures are visible for a moderate period of time when driving, but the distance from the viewer reduces the impact.

Photo 29

The east side of the Highway 3 crossing with the ascent of the east side of the valley parallel to the West Kootenay Power and Light Co. 230 kV line. The right-of-way is visible for some distance along the highway however, being parallel to the West Kootenay Power and Light Co. line and the distance from the viewer make the impact of the 500 kV line small.

Photo 30

The crossing of Highway 3 at Cascade. The right-of-way at the crossing is screened by trees that have been topped. This tree topping has provided the necessary clearance to the conductors while maintaining a strip of vegetation to conceal the line from the highway.

Photo 31

An example of the selective clearing that was carried out to avoid disturbance to the Dewdney Trail. At this point, the trail traverses the right-of-way in the foreground of the picture, and then traverses back across the right-of-way in front of the structure in the distance. The West Kootenay line and the pipeline right-of-way are noticeable in the distance.

Photo 32

The transmission line viewed from King George VI Provincial Park. The distance from the park, (approximately 2 km) reduces the visibility of the line.

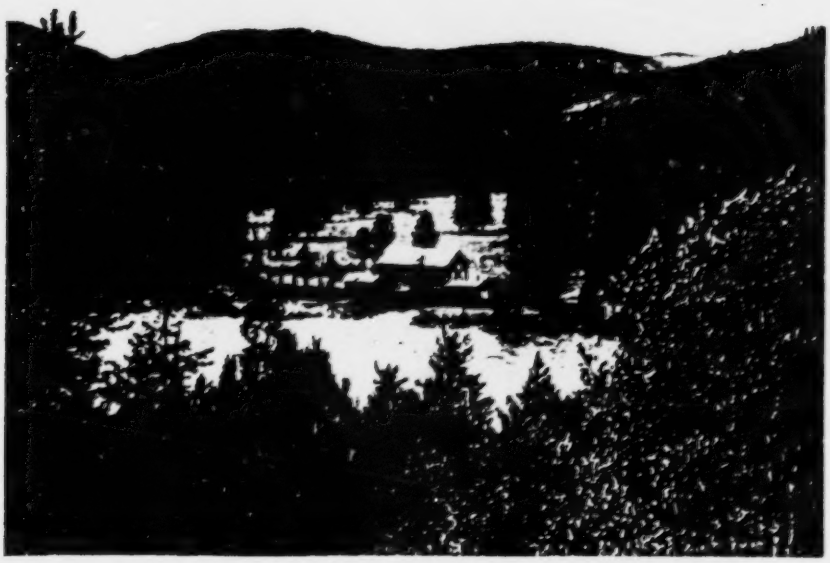


Photo 33

A view south from Highway 6 overlooking the Salmo River. The conductors of the long crossing span and the structure tops are only momentarily visible when driving down the highway. Very little right-of-way clearing is apparent.

Photo 34

A view of the line travelling north on Highway 6. A section of the west side of the valley is visible for a short time to highway travellers. Only structure tops and conductors can be seen, no right-of-way clearing which greatly reduces its visibility.

Photo 35

The first crossing of the Salmo-Creston Highway (Highway 3) looking east. The crossing structures on both sides are out of sight and only the conductors are visible.

Photo 36

Looking west, towards Salmo, at the second crossing of the Salmo-Creston Highway. The structures are again well screened with only the conductors visible.

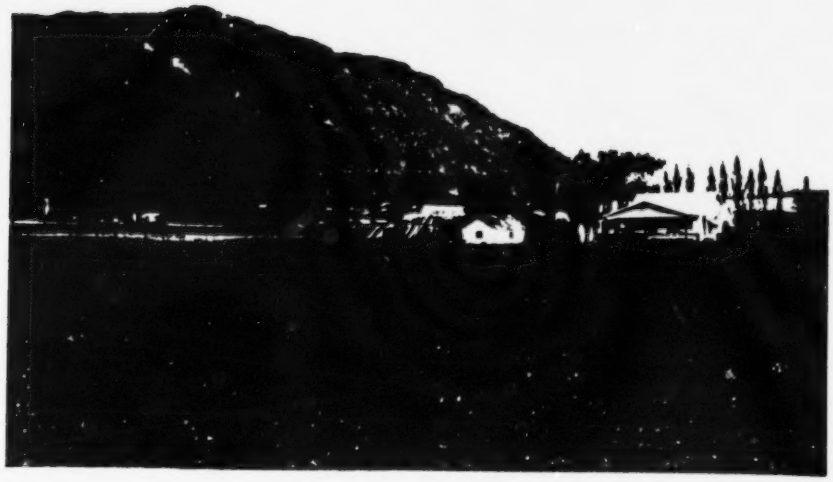


Photo 37

The ascent of the Creston Bluffs on the east side of the Creston valley viewed from the southern limits of Creston. The scattered vegetation makes the right-of-way inconspicuous and the structures and conductors are not visible due to the distance the line is away.

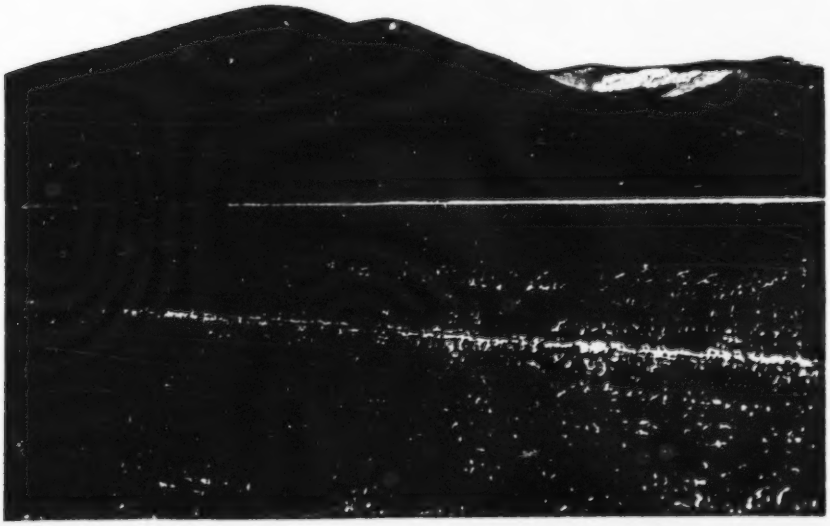


Photo 38

The transmission line on the west side of the Creston valley in the vicinity of the Dale Marsh. This view is taken from a farm access road in the valley.

Photo 39

The descent of the transmission line on the west side of the Creston valley viewed from Highway No. 3 at the east entrance to Creston. The line, although visible, is lost in the clutter of wires along the highway.

Photo 40

The descent of the transmission line on the west side of the Creston valley viewed from the southern limits of the town on Creston. The line across the valley flobr is hidden from view by the valley vegetation.

Photo 41

The Kitchener valley viewed from the highway approximately 4.5 km east of the highway crossing. The north descent to the valley and the structures in the valley are totally screened from view and the south side is only momentarily visible when travelling on the highway.

Photo 42

The Highway 3 crossing at Kitchener looking east. The north side of the crossing is not visible and the south. Side structures are only momentarily visible to the highway traveller.

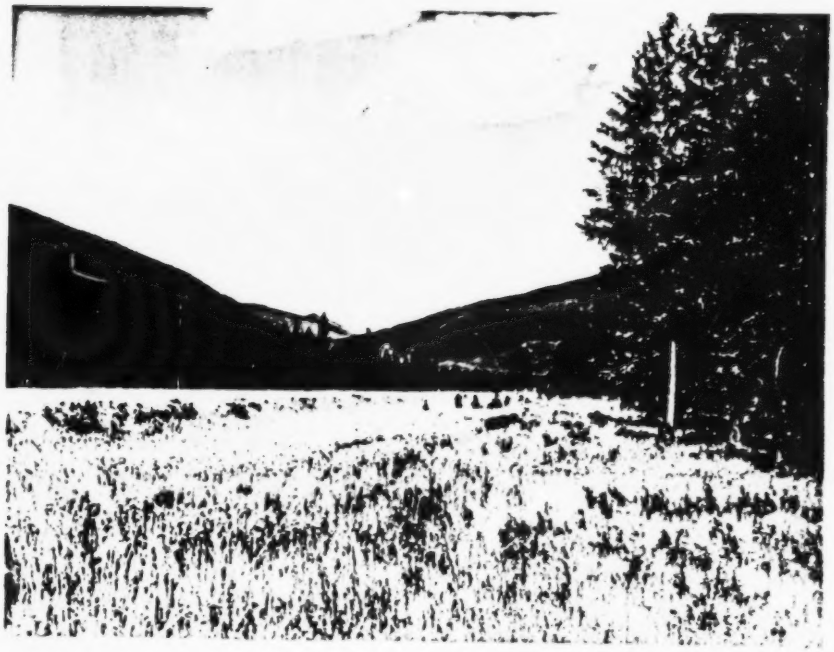


Photo 43

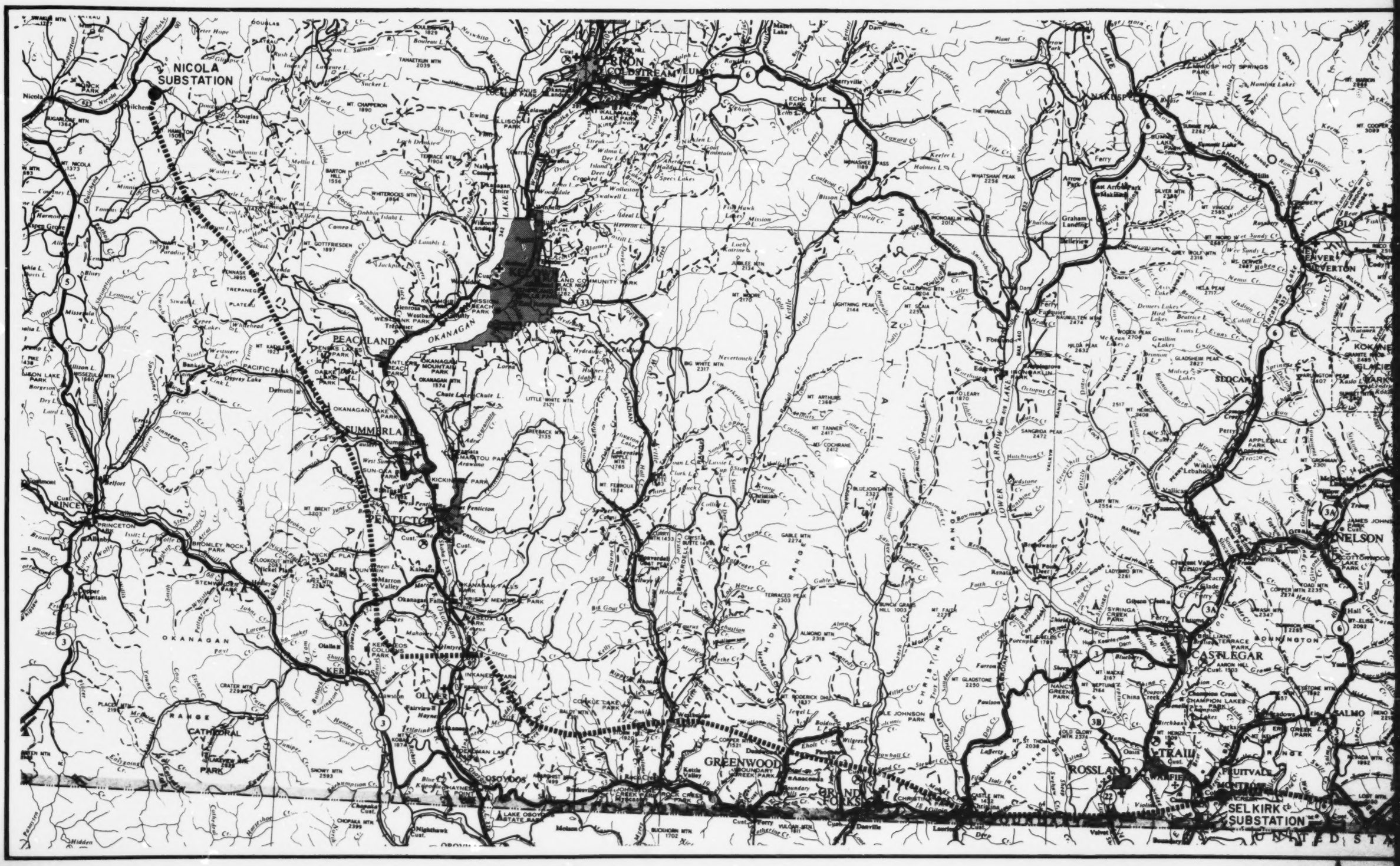
The Highway 3 crossing at Kitchener viewed from the highway rest area just east of the crossing. Only the conductors across the highway are visible. The structures and right-of-way are totally hidden.

Photo 44

The Highway 3 crossing near Lumberton. A strip of trees was left to help conceal the line. As a result only the conductors and marker balls of the 500 kV line are noticeable to the highway traveller.

Photo 45

From the city of Cranbrook the line is so distant (approximately 6 km) that it is virtually invisible.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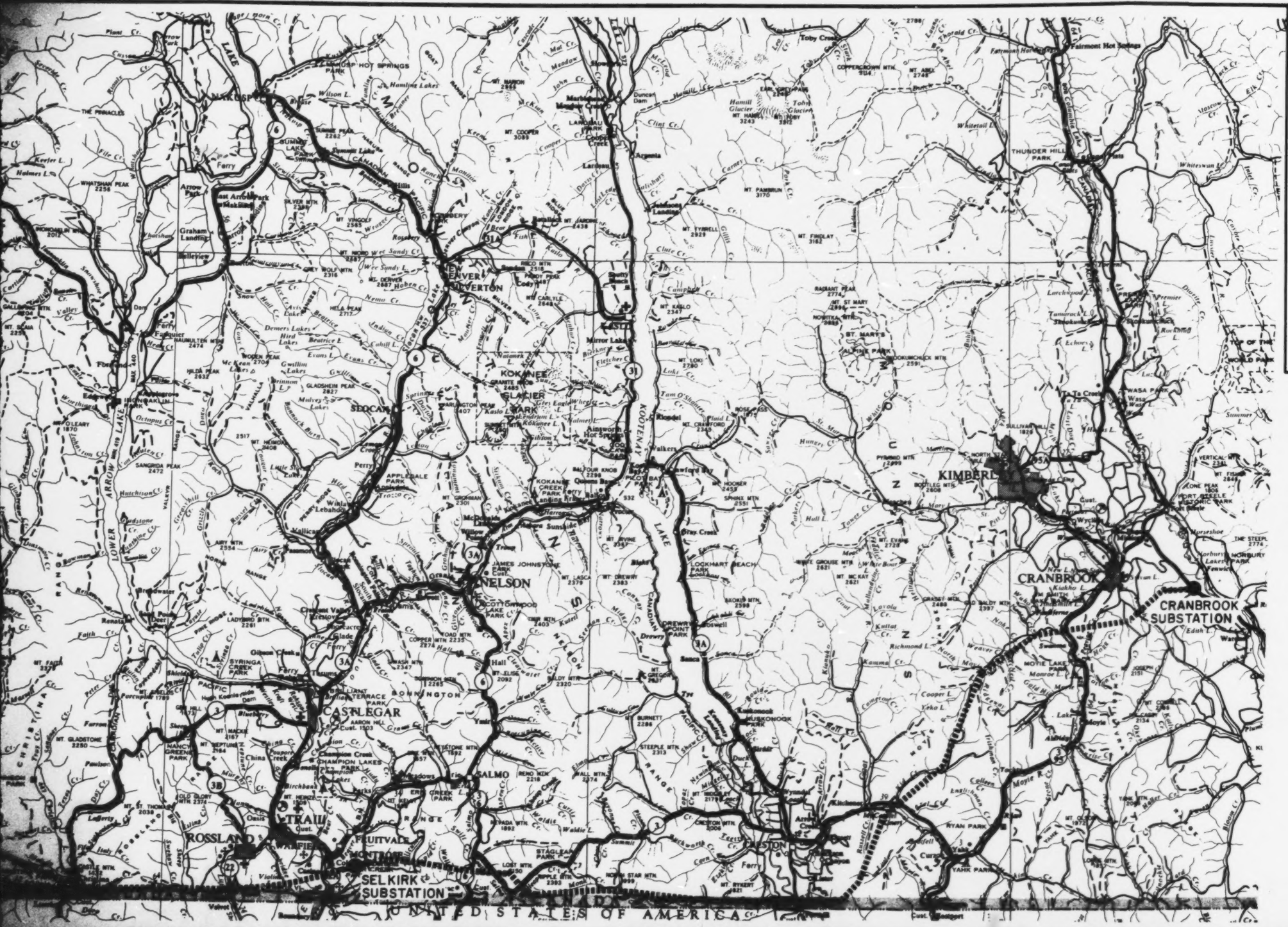
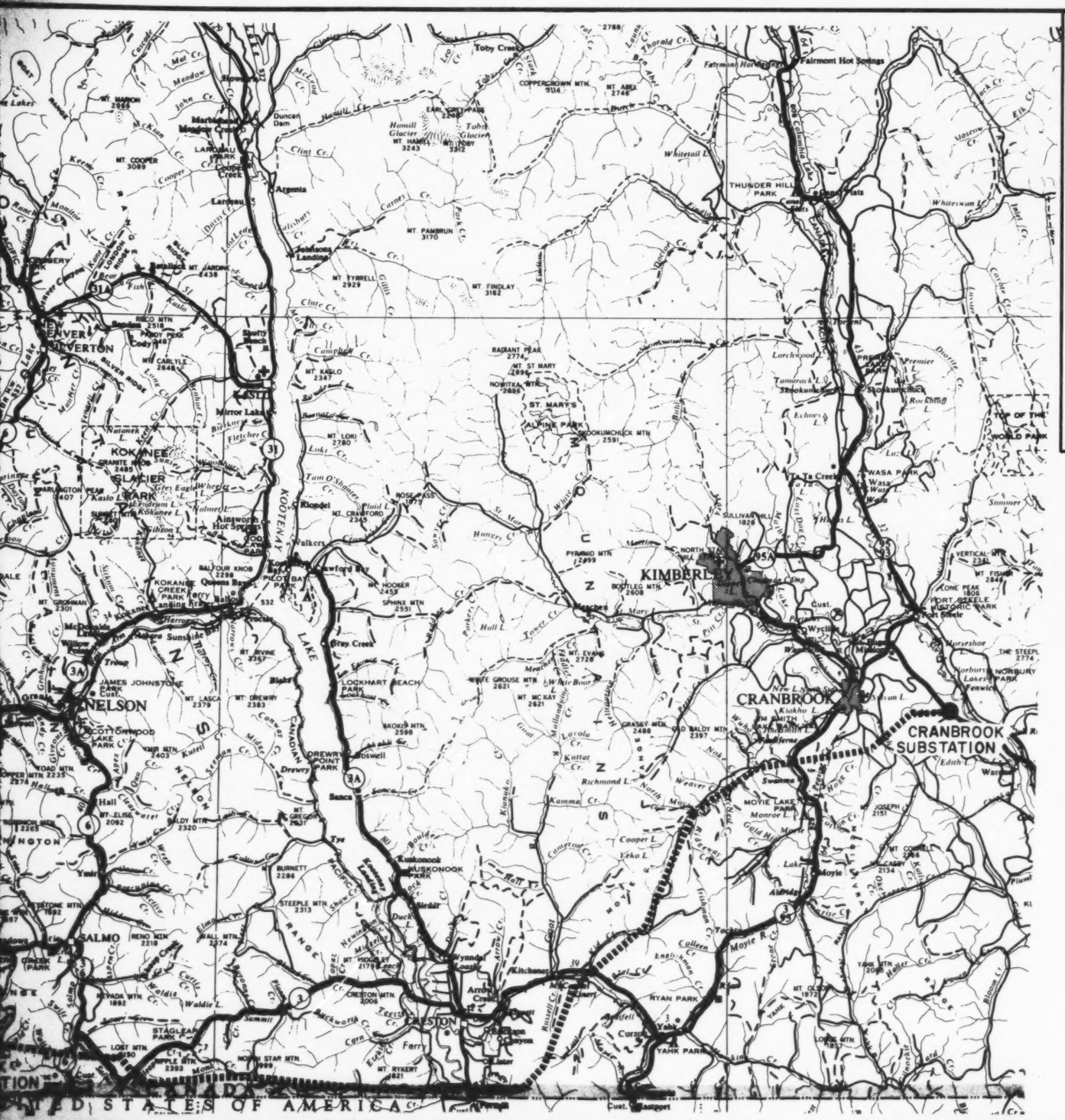
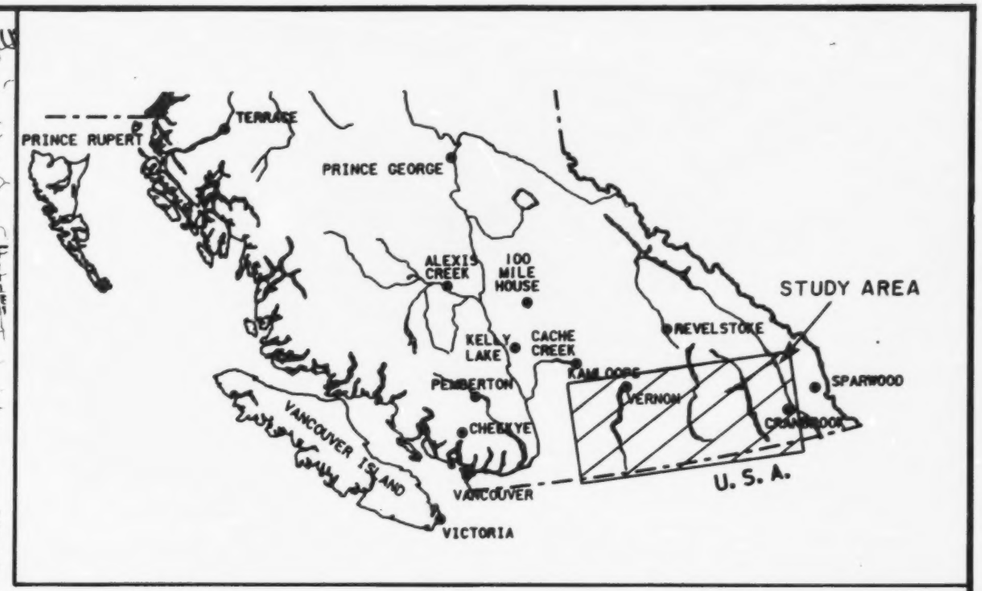
KELOWNA
PENTICTON
PEACHLAND
SUMMERLAND
PRINCETON
OKANAGAN
KERMEOS
OLIVER
OSOYOOS
GREENWOOD
GRAND FORKS
ROSSLAND
TRAIL
CASTLEGAR
NELSON
SALMO
KASLO
NAKUSP
SILVERTON
SLOCAN
KOKANEE GLACIER PARK
SELKIRK SUBSTATION
COLDSTREAM
LUMBY
OKANAGAN LAKE
ARROW LAKES
OKANAGAN MOUNTAIN PARK
MT. BAKER RANGE
SELKIRK MTS.
MONASHEE MTS.
CHRISTINA RANGE
MIDWAY
BOUNDARY
UNITED STA


PRINCE RUPERT
TERRACE
PRINCE GEORGE
ALEXIS CREEK
100 MILE HOUSE
KELLY LAKE
CACHE CREEK
PEMBERTON
CHEMAINUS
VANCOUVER ISLAND
VANCOUVER
VICTORIA
KEY PLAN
0 15 30 45km
SCALE
1:600,000
KIMBERLEY
CRANBROOK
CRANBROOK SUBSTATION
NELSON
CASTLEGAR
TRAIL
ROSSLAND
SALMO
KOKANEE GLACIER PARK
SLOCAN
NEW DENVER
SILVERTON
KASLO
CRESTON
SELKIRK SUBSTATION
UNITED STATES OF AMERICA




KEY PLAN

0 15 30 45km

SCALE

1:600,000

B.C. HYDRO

NICOLA - SELKIRK - CRANBROOK
500KV TRANSMISSION LINE
FINAL ROUTE LOCATION